

REMARKS

Claims 36-39, 41, 43, and 45-47 are pending in the present application. Claims 1-35, 40, 42, 44, and 48-65 were with withdrawn subject to restriction/election requirements. Reconsideration of the application is respectfully requested in view of the following responsive remarks.

In the office action of August 10, 2005, the following actions were taken:

(1) Claims 36-39, 43, and 47 were rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent Application No. 2002/0198287 to Ohta et al. (hereinafter "Ohta");

(2) Claims 36-39, 41, 43, and 45-47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Ohta;

(3) Claims 36-39 and 43 were rejected under 35 U.S.C 102(b) as being anticipated by JP 62283174 to Handa et al (hereinafter "Handa");

(4) Claims 36-39 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Handa;

(5) Claims 36-39 and 43 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,981,651 to Patel et al. (hereinafter "Patel");

(6) Claims 36-39 and 43 were rejected under 35 U.S.C. 103(a) as being unpatentable over Patel;

(7) Claims 36-39, 43, and 47 were rejected under 35 U.S.C 102(b) as being anticipated by EP 1108758 to Johnson et al (hereinafter "Johnson");

(8) Claims 36-39 43, and 47 were rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson;

(9) Claims 36-39, 41, 43, and 45-47 were rejected under 35 U.S.C 102(b) as being anticipated by EP 869 160 to Nichols et al. (hereinafter "Nichols"); and

(10) Claims 36-39, 41, 43, and 45-47 were rejected under 35 U.S.C 103(a) as being unpatentable in view of Nichols.

It is respectfully submitted that the presently pending claims be reconsidered and allowed.

The Examiner has rejected claims 36-39, 41, 43, and 45-47 under 35 U.S.C. 102 and 35 U.S.C. 103 over five individual references. The Examiner has asserted that each of the references teaches the same product taught in the product-by-process claim of claim 36. The Applicant acknowledges that patentability in product by process claims is based on the end product itself and not its method of production. However, the Applicant asserts that the products taught in each of the cited references cannot be the same as the claimed product by virtue of the fact that were in fact made by a different process, and that the process used by the Applicant will not yield the same product as those in the cited prior art. As the Examiner has cited five references under both 35 U.S.C. §§ 12 and/or 103, the rejections will be discussed based on each individual reference rather than by the nature of the rejection.

Present Invention

Claim 36 of the present invention teaches a latex-containing ink-jet ink, including a liquid vehicle, a colorant that is dissolved or dispersed in the vehicle, and latex particulates that are dispersed in the liquid vehicle. The latex particulates are formed by a specific process which requires the preparation of a monomer emulsion which includes an aqueous phase and an organic monomer (dispersed or co-dispersed in the aqueous phase) including at least one blocked acid monomer. In other words, the polymerization (or copolymerization) of the blocked acid monomer occurs within the discontinuous phase of the aqueous emulsion. After polymerization of the organic monomer(s), which includes at least one blocked acid monomer, blocked acid latex particulates dispersed within the aqueous phase are formed. The blocked acid latex particulates are unblocked to form acidified latex particulates that are suspended in the aqueous phase, and the aqueous phase forms at least part of the liquid vehicle of the ink-jet ink.

Rejections based on Ohta

The Examiner rejected claims 36-39, 41, 43, 45, and 46 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Ohta. Specifically, the Examiner points out that Ohta teaches a latex containing ink-jet ink comprising an aqueous liquid vehicle, a pigment colorant dissolved or dispersed in the liquid vehicle, and a dispersed surface sulfonated acidic emulsion latex. Although Ohta appears to teach a similar ink to the ink claimed in claim 36, the ink composition is not the same because of the process or method of manufacture of the latex particles. Ohta teaches that the sulfonated latex particles used in its ink can be made in two different ways. First, the sulfonated dispersibility-imparting group can be part of the monomer structure of the constituent resin and then polymerized. Second, the a base polymer or skeletal backbone of styrene-(meth)acrylic acid is made without the sulfur containing dispersibility-group. Then the already polymerized styrene copolymer can be altered so that and the dispersibility-imparting group is grafted to the skeletal backbone of the styrene copolymer. In other words, the monomers are polymerized together first and then a sulfur containing group is grafted added. See Paragraph 59 of the Ohta specification.

As is generally known in the art, latex particulate surface charge is typically created through emulsion polymerization of an acid monomer, with or without other monomers, to form latex particulates. Such acid monomers should be sufficiently hydrophobic to substantially remain in the organic phase of the emulsion that forms the particles. The need for hydrophobicity has limited effective polymer design to the use of relatively weak organic acids, typically carboxylic acids, having correspondingly low ionization. Thus, monomers including strong acids (such as sulfonates, phosphonates, etc.), or monomers including multiple acids (such as di-acids), are excessively water soluble for typical emulsion polymerization processes. Moreover, strong acid monomers or multiple acid monomers tend to migrate out of the organic phase and into the water phase where they form detrimental water-soluble and ion-bearing polymers. The resultant increase in the ionic strength of the aqueous phase of the latex dispersion reduces the effect of the charge

surrounding each particle, weakening particle dispersion stability. This is why the process of manufacturing the latex is so important, and why the process of manufacture affects the final compositional properties.

As described above, the sulfur containing polymer latex used in Ohta can be manufactured in two ways. The first method of incorporating sulfur containing dispersibility-groups involves polymerizing monomers which already have sulfur containing groups attached thereto. The monomers are polymerized together using emulsion polymerization to yield a copolymer having sulfur containing groups at least on the surface. As mentioned previously, this type of polymerization is problematic in that the strong acid or sulfur containing monomers have the tendency to migrate out of the organic phase and into the water phase prior to polymerization because of their high solubility. This results in a latex solution that has high concentrations of sulfur containing monomers in the aqueous phase thereby weakening the desired effect of stable particle dispersion. It is worth noting that it is this exact type of problem that the claimed composition and the associate method of latex manufacture of the present invention is intended to overcome.

Similarly, the second method of incorporating the sulfur containing dispersibility group also yields a distinct latex composition when compared to that made by the currently claimed. Polymerizing the monomers and then grafting on the dispersibility imparting group yields a latex polymer emulsion with residual dispersibility-imparting groups in the aqueous phase (see paragraph 70 of Ohta).

The process of manufacturing the latex particles used in the ink of claim 36 is distinct from both of the processes taught in Ohta and, as discussed, it yields a unique latex ink composition. Not only does the ink composition of claim 36 not have large amounts of unpolymerized sulfur monomers or unattached sulfur containing dispersibility groups present during formation (which preserves the greater ionic difference between the latex particles and the aqueous phase), but the ink composition has amounts of the blocking members which are free after the blocked acid groups are unblocked become released into the aqueous phase. Neither of these compositional properties are present in Ohta. Therefore, as the ink composition of claim 36

is distinct over those taught in Ohta, it is respectfully requested that all rejections with respect to this reference be withdrawn.

Rejections based on Handa and Patel

The Examiner rejected claims 36-39 and 43 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Handa or Patel. As discussed above, the process for manufacturing the latex component of the claimed ink composition affects the nature of the composition. Handa teaches an ink composition with a carboxylic acid-containing polymer. Patel teaches a similar ink composition including water, a colorant, and polymer particles of styrene butylacrylate acrylic acid. In neither Handa nor Patel is there any teaching or discussion of using blocked acid monomers to make the latex and then unblocking the acid groups after polymerization. As discussed above, because there is no blocking or unblocking taking place in the manufacture of the polymers in the cited reference, the resulting latex containing ink compositions are distinct as compared to the ink composition of claim 36. Specifically, the use of acids (even weak acids) on monomers that are not blocked will result in some migration of acidic monomers into the aqueous phase. With the blocked acid monomers of the present invention, this migration is significantly reduced or avoided, resulting in a distinguishable composition. Therefore, it is respectfully requested that all rejections with respect to these references be withdrawn.

Rejections based on Johnson

The Examiner rejected claims 36-39, 43 and 47 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Johnson. Johnson teaches an ink-jet composition including a colorant and a polymeric binder. The polymeric binder is an emulsion-polymerized addition copolymer formed from a monomer mixture of ethylenically unsaturated monomers including 4-15% of at least one ethylenically unsaturated carboxylic acid functional monomer. However, Johnson is similar to Handa and Patel in that the acid groups of the monomers are not blocked prior to and then unblocked after the emulsion polymerization process. As discussed above, this

difference in process results in a different compositional make-up of the ink composition, i.e. acid monomers migrating to the aqueous phase causing less differential of ionic character between the aqueous phase and the latex particles, etc. Therefore, Johnson does not teach a product that is equivalent to the product of claim 36. This being the case, the Applicants respectfully request that all rejections based on this reference be withdrawn and the claims be allowed.

Rejections based on Nichols

The Examiner rejected claims 36-39 41, 43, and 45-47 under 35 U.S.C. 102 and 103 as being either anticipated by or unpatentable over Nichols. Nichols teaches an ink composition including an ink vehicle and a resin emulsion of resin particles and a pigment colorant. The resin emulsion is an emulsion polymerized resin of monomers having carboxylic acid groups. Once again, there is no teaching of blocking the acid group prior to polymerization and unblocking the acid group after polymerization. As the product of the current invention is made in this manner, it yields an effectively distinct and unique ink composition for the reasons laid out above. Therefore, it is respectfully requested that all rejections based on this reference be withdrawn and all the claims be allowed.

In view of the foregoing, Applicant believes that claims 36-39, 41, 43, and 45-47 present allowable subject matter and allowance is respectfully requested. If any impediment to the allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to telephone W. Bradley Haymond (Registration No. 35,186) at (541) 715-0159 so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any
overpayment to Deposit Account No. 08-2025

Dated this the 10th day of November, 2005.

Respectfully submitted,



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